



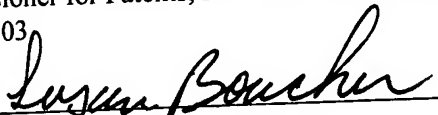
PATENT
Attorney Docket No. IBX-005

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT(S): Card et al.
SERIAL NO.: 10/621,532 GROUP NO.: Not yet assigned
FILING DATE: July 17, 2003 EXAMINER: Not yet assigned
TITLE: Control of Complex Manufacturing Processes Using Continuous
Process Data

CERTIFICATE OF FIRST CLASS MAILING UNDER 37 C.F.R. 1.8

I hereby certify that this correspondence, and any document(s) referred to as enclosed herein, is/are being deposited with the United States Postal Service as first class mail, postage prepaid, in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 30 day of September, 2003.


Susan Boucher

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith is/are:

Transmittal Form (1 page); Information Disclosure Statement (3 pages);
PTO Form 1449 (2 pages); copies of cited references (A-A5, B1-B2, C1-C12); and a
return-receipt postcard.



TRANSMITTAL FORM

| | |
|---------------------------|------------------|
| Application Serial Number | 10/621,532 |
| Filing Date | July 17, 2003 |
| First Named Inventor | Card |
| Group Art Unit | Not yet assigned |
| Examiner Name | Not yet assigned |
| Attorney Docket No. | IBX-005 |
| Patent No. | Not applicable |
| Issue Date | Not applicable |

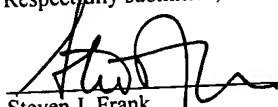
ENCLOSURES (check all that apply)

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|--|---|--|
| <input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Check Attached <input type="checkbox"/> Copy of Fee Transmittal Form | <input type="checkbox"/> Copy of Notice to File Missing Parts of Application (PTO-1553) | <input type="checkbox"/> Notice of Appeal to Board of Patent Appeals and Interferences |
| <input type="checkbox"/> Amendment/Response <input type="checkbox"/> Preliminary <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Letter to Official Draftsperson including Drawings [Total Sheets ____] | <input type="checkbox"/> Formal Drawing(s) | <input type="checkbox"/> Appeal Brief (in triplicate) |
| <input type="checkbox"/> Petition for Extension of Time | <input type="checkbox"/> Request For Continued Examination (RCE) Transmittal | <input type="checkbox"/> Status Inquiry |
| <input checked="" type="checkbox"/> Information Disclosure Statement <input checked="" type="checkbox"/> Form PTO-1449 <input checked="" type="checkbox"/> Copies of IDS Citations | <input type="checkbox"/> Power of Attorney (Revocation of Prior Powers) | <input checked="" type="checkbox"/> Return Receipt Postcard |
| <input type="checkbox"/> Certified Copy of Priority Document(s) | <input type="checkbox"/> Terminal Disclaimer | <input checked="" type="checkbox"/> Certificate of First Class Mailing under 37 C.F.R. 1.8 |
| <input type="checkbox"/> Sequence Listing submission <input type="checkbox"/> Paper Copy/CD <input type="checkbox"/> Computer Readable Copy <input type="checkbox"/> Statement verifying identity of above | <input type="checkbox"/> Executed Declaration and Power of Attorney for Utility or Design Patent Application | <input type="checkbox"/> Certificate of Facsimile Transmission under 37 C.F.R. 1.8 |
| | <input type="checkbox"/> Small Entity Statement | <input type="checkbox"/> Additional Enclosure(s) (please identify below) |
| | <input type="checkbox"/> CD(s) for large table or computer program | |
| | <input type="checkbox"/> Amendment After Allowance | |
| | <input type="checkbox"/> Request for Certificate of Correction <input type="checkbox"/> Certificate of Correction (in duplicate) | |

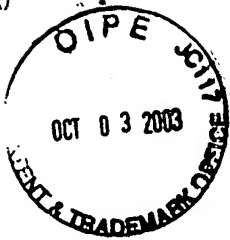
CORRESPONDENCE ADDRESS

Direct all correspondence to: Patent Administrator
Testa, Hurwitz & Thibault, LLP
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SIGNATURE BLOCK

Respectfully submitted,

Steven J. Frank
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Date: September 20, 2003
Reg. No. 33,497
Tel. No.: (617) 310-8108
Fax No.: (617) 790-0178



PATENT
Attorney Docket No. IBX-005

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Sir:

In accordance with the provisions of 37 C.F.R. 1.97 and 1.98, Applicants hereby make of record the patents and publications listed on the accompanying Form PTO-1449, and other information contained herein, for consideration by the Examiner in connection with the examination of the above-identified patent application. Copies of the patents and publications are enclosed.

REMARKS

In accordance with the provisions of 37 C.F.R. 1.97, this statement is being filed (CHECK ONE):

- ☒ (1) within three (3) months of the **filing date** of a national application other than a continued prosecution application under 37 C.F.R. 1.53(d), or within three (3) months of the **date of entry of the national stage** as set forth in 37 C.F.R. 1.491 in an international application, or before the mailing of the **first Office action** on the merits, or before the mailing of a **first Office action** after the filing of a request for continued examination under 37 C.F.R. 1.114; or
- ☐ (2) after the period defined in (1) but before the mailing date of a **final action** or a **notice of allowance** under 37 C.F.R. 1.311, and
- ☐ the requisite Statement is below, **OR**
- ☐ the requisite fee under 37 C.F.R. 1.17(p), namely **\$180.00**, is included herein, or

- ☐ (3) after the mailing date of a **final action** or **notice of allowance** but before the payment of the **issue fee**, **AND**
- ☐ the requisite Statement is below, **AND**
- ☐ the requisite petition fee under 37 C.F.R. 1.17(p), namely **\$180.00** is included herein.

It is respectfully requested that each of the patents and publications listed on the attached Form PTO-1449, and other information contained herein, be made of record in this application.

STATEMENT

As required under 37 C.F.R. 1.97(e), Applicant(s), through the undersigned, hereby state either that [check the appropriate space only if either (2) or (3) is checked on the previous page and the Statement is required]:

- ☐ 1. Each item of information contained in the Information Disclosure Statement was first cited in any communication from a foreign patent office in a counterpart foreign application **not more than three months** prior to the filing of the Information Disclosure Statement; or
- ☐ 2. No item of information contained in the Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing this Statement after making reasonable inquiry, no item of information contained in the Information Disclosure Statement was known to **any individual** designated in 37 C.F.R. 1.56(c) **more than three months** prior to the filing of the Information Disclosure Statement.

In addition, Applicant wishes to inform the Examiner about the following co-pending patent applications, publications, issued patents, and Office Actions issued therein:

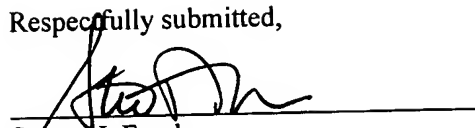
U.S. Serial No. 10/243,963, filed on September 13, 2002, by Card et al. (IBX-001);
U.S. Serial No. 10/244,154, filed on September 13, 2002, by Reitman et al. (IBX-002);
U.S. Serial No. 10/645,209, filed on August 21, 2003, by Chan et al. (IBX-004); and
U.S. Serial No. 10/656,607, filed on September 5, 2003, by Card et al. (IBX-008).

Date: September 30, 2003
Reg. No. 33,497

Tel. No.: (617) 310-8108
Fax No.: (617) 248-7100

2683175_1

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Steven J. Frank', is written over a horizontal line.

Steven J. Frank
Attorney for the Applicants
Testa, Hurwitz, & Thibault, LLP
High Street Tower
125 High Street
Boston, Massachusetts 02110



| | |
|---|--|
| FORM PTO - 1449 INFORMATION DISCLOSURE STATEMENT | ATTORNEY DOCKET NO.: IBX-005 APPLICANT(S): Card et al. SERIAL NO.: 10/621,532 FILING DATE: 7/17/03 GROUP: Not yet assigned |
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U.S. PATENT DOCUMENTS

| EXAM. INIT. | | DOCUMENT NUMBER | DATE | NAME | CLASS | SUB CLASS | FILING DATE IF APPROPRIATE |
|----------------|----|--------------------|----------|----------------|-------|--------------|-------------------------------|
| | A1 | 5,467,883 | 11/21/95 | Frye et al. | 216 | 60 | 11/27/93 |
| | A2 | 5,559,690 | 9/24/96 | Keeler et al. | 364 | 164 | 9/16/94 |
| | A3 | 5,654,903 | 8/5/97 | Reitman et al. | 364 | 551.01 | 11/7/95 |
| | A4 | 5,740,033 | 4/14/98 | Wassick et al. | 364 | 149 | 10/13/92 |
| | A5 | 6,268,226 | 7/31/01 | Angell et al. | 438 | 16 | 6/30/99 |
| | | | | | | | |

FOREIGN PATENT DOCUMENTS

| EXAM. INIT. | | DOCUMENT NUMBER | DATE | COUNTRY CODE | CLASS | SUB CLASS | FILING DATE | ABSTRACT ONLY | ENGLISH LANG (Y/N) |
|----------------|----|--------------------|---------|-----------------|-------|--------------|----------------|------------------|--------------------------|
| | B1 | WO 01/57605 | 8/9/01 | WO | G05B | 13/04 | 1/11/01 | N | Y |
| | B2 | DE196 37 917 A1 | 3/19/98 | DE | G05B | 13/04 | 9/17/96 | Y | |
| | | | | | | | | | |

OTHER ART, JOURNAL ARTICLES, ETC.

| EXAM. INIT. | OTHER DOCUMENTS: (Including Author, Title, Date, Relevant Pages, Place of Publication) |
|-------------|---|
| ✓ | C1 Card et al., "Dynamic Neural Control for Plasma Etch Process," <u>IEEE Transactions on Neural Networks</u> , (1997). |
| ✓ | C2 Dillon et al., "Guest Editorial Everyday Applications of Neural Networks," <u>IEEE Transactions on Neural Networks</u> , 8:4 (July 1997). |
| ✓ | C3 Hatzipantelis et al., "Comparing Hidden Markov Models with Artificial Neural Network Architectures for Condition Monitoring Applications," <u>Artificial Neural Networks</u> , 26-28, Conference Publication No. 409 (June 1995). |
| ✓ | C4 Kim et al., "Intelligent Control of Via Formation by Photosensitive BCB for MCM-L/D Applications," <u>IEEE Transactions on Semiconductor Manufacturing</u> , 12:503 (1999). |
| ✓ | C5 Konstantopoulos et al., "Controllers with Diagnostic Capabilities. A Neural Network Implementation. <u>Journal of Intelligent and Robotic Systems</u> ," Department of Electrical Engineering, University of Notre Dame, IN 12: 197-228 (1995). |



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| ✓ | C6 | Lada et al., "A Wavelet-Based Procedure for Process Fault Detection," (September 17, 2001). |
| ✓ | C7 | Moyne, "AEC/APC Vision: A Research and Suppliers' Point of View," 3 rd Annual European AEC/APC Conference Proceedings (2002). |
| ✓ | C8 | Rietman et al., "A Study on $\mathcal{R}^m \rightarrow \mathcal{R}^1$ Maps: Application to a 0.16- μ m Via Etch Process Endpoint," <u>IEEE</u> (2000). |
| ✓ | C9 | Rietman et al., "A System Model for Feedback Control and Analysis of Yield: A Multistep Process Model of Effective Gate Length, Poly Line Width, and IV Parameters", <u>IEEE</u> (2001). |
| ✓ | C10 | Rietman, "Neural Networks in Plasma Processing," <u>Journal of Vacuum Science and Technology: Part B, IEEE Transactions on Semiconductor Manufacturing</u> , 14:1 (2001). |
| ✓ | C11 | Smyth et. al., "Hidden Markov Models and Neural Networks for Fault detection in Dynamic Systems," California Institute of Technology (1993). |
| ✓ | C12 | Zhang et al, "Control of Spatial Uniformity in Microelectronics Manufacturing: An Integrated Approach," Proceedings of AEC/APC (2000). |
| | | |
| EXAMINER | | DATE CONSIDERED |